

Serial No. 10/697,626

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Response to Office Action mailed December 27, 2005

REMARKS

Claims 1-8, 10-18, 21-26, 28-29, 31-32 and 35-40 are pending in the present application. Reconsideration of the pending Claims in view of the following remarks is respectfully requested.

Claim Rejections pursuant to 35 U.S.C. §112 second paragraph

Claims 1, 11-15, 22, 24-26, 31-32, 35, and 38-39 stand rejected pursuant to 35 U.S.C. §112 second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter applicant regards as the invention. The office action mailed December 27, 2005 indicates the Claims recite "audio power amplifier" and "current-feedback audio amplifier" whereas the specification recites "power amplifier" and "current-feedback power amplifier" only.

Paragraph 0009 of the Applicant's specification recites:

A loudspeaker is provided for receiving an incoming electrical signal and transmitting an acoustical signal. The loudspeaker may include a *power amplifier that receives the incoming electrical signal and provides a power signal to two or more passive filters, such as low-pass, band-pass, or high-pass filters*, which are coupled to the output of the power amplifier. *The passive filters may be coupled to one or more speaker drivers* so that the arrangement of passive filters and speaker drivers has a single input with a single combined input impedance. The amplifier may have an output impedance between about 25% and about 400% of the combined input impedance of the arrangement of passive filters and speaker drivers. The power amplifier may include a current-feedback amplifier that is configured to maintain the desired impedance at the output. (*emphasis Applicant's*)

Clearly, a loudspeaker is a piece of audio equipment, and a power amplifier driving such a loudspeaker is also a piece of audio equipment. Thus, as is well known in the art, a power amplifier that receives electrical signals and provides an amplified signal to drive such a loudspeaker is also commonly referred to as audio amplifier or an audio power amplifier.

In addition, Figure 1 of Applicants specification clearly illustrates a power amplifier (102) driving a first speaker driver (106) and a second speaker driver (110). As is well known in the art, a power amplifier that is coupled with a loudspeaker can be interchangeably described as an audio amplifier or an audio power amplifier. For example, see U.S. Patent No. 5,097,223, Col. 1, lines 1-24, and U.S. Patent No. 5,598,480, Col. 1, lines 31-36 and 46-52. In addition, paragraph 0048 recites "FIG. 9 is a frequency response graph for the speaker drivers 106 and 110 where the current-feedback amplifier 102 shown in FIG. 4 drives the driver circuit 114 shown in FIGS. 1-3." The

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entire present patent application describes and discusses audio systems, power amplifiers for driving audio devices, and operational performance thereof (See frequency response curves of Figures 5-10) thus, use of the term "audio power amplifier" and "current-feedback audio amplifier" are well known to those skilled in the art and define the invention with a reasonable degree of clarity and precision. (See MPEP 2173.02)

Although the terms "audio power amplifier" and "current-feedback audio amplifier" are not specifically used in the specification, the terms are clear and precise and well within the latitude provided to the Applicant in defining the invention. "A claim term that has no antecedent basis in the disclosure is not necessarily indefinite" (MPEP 2173.05(e)). Since Applicant's claims are clear and precise and are well supported by the detailed description and drawings in the specification, Applicant respectfully requests withdrawal of the 35 U.S.C. §112 second paragraph rejection of these claims.

Claim Rejections pursuant to 35 U.S.C. §103(a)

Claims 1, 15, 21-24, 26, 28 and 32 stand rejected pursuant to 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,598,480 to Kim (hereinafter "Kim") in view of U.S. Patent No. 5,097,223 to Alexander (hereinafter "Alexander") and further in view of U.S. Patent No. 4,670,709 to Iredale (hereinafter "Iredale"). Claims 2, 3, 16 and 17 stand rejected pursuant to 35 U.S.C. §103(a) as being unpatentable over Kim, in view of Alexander, in view of Iredale and further in view of U.S. Patent No. 4,504,704 to Oyaba (hereinafter "Oyaba"). Claims 4, 5 and 18 stand rejected pursuant to 35 U.S.C. §103(a) as being unpatentable over Kim, in view of Alexander, in view of Iredale and further in view of U.S. Patent No. 4,751,738 to Widrow et al. (hereinafter "Widrow"). Claims 6, 7 10-13, and 29 stand rejected pursuant to 35 U.S.C. §103(a) as being unpatentable over Kim, in view of Alexander, in view of Iredale and further in view of U.S. Patent No. 5,533,135 to Gary (hereinafter "Gary"). Claim 14 stands rejected pursuant to 35 U.S.C. §103(a) as being unpatentable over Kim in view of Iredale and further in view of U.S. Patent Publication No. 2004/0101153 to Grudin (hereinafter "Grudin"). Claims 35, 38 and 40 stand rejected pursuant to 35 U.S.C. §103(a) as being unpatentable over Kim, in view of Alexander, in view of Iredale and further in view of Microelectronics Circuits by Adel S. Sedra, Oxford University Press 1998, pgs. 668-671 and Figure 8.1. Applicant respectfully traverses these

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rejections for at least the following reasons because the cited prior art fails to teach, suggest or disclose the invention described in the presently pending claims.

Claims 1-8, 10-14 and 35-37

Claim 1 includes the limitation of an audio power amplifier having an input and an output, wherein the audio power amplifier includes a current-feedback amplifier configured to create a desired impedance at the output. In contrast, Alexander describes an audio power amplifier with a current feedback operational amplifier design that includes a buffer amplifier (A1) used for audio gain and a pair of current mirrors (16, 18) supplying charging current to a gain node of the amplifier. (Col. 3 lines 24-27, Col. 4 lines 34-38) Clearly, Alexander does not teach, suggest, or disclose a current-feedback amplifier configured to create a desired impedance at an output of an audio power amplifier as described in Claim 1. To, the contrary, Alexander teaches away by teaching a current feedback circuit that balances the output current of amplifier A1 so that the voltage at an output terminal (14) follows the audio input signal supplied to amplifier A1 in a stable and amplified manner. (Col. 2 lines 46-56) Clearly, maintaining a desired voltage at an output as described by Alexander is completely different than maintaining a desired impedance at an output as described in Claim 1.

Claim 1 also includes the limitation of a current-feedback amplifier configured to create a desired impedance at the output that is between about 25 percent and about 400 percent of the input impedance of the driver circuit. In contrast, Iredale teaches away from such a configuration by teaching that a power amplifier that directly drives a speaker having an output impedance that approximately matches an input impedance of the speaker. (Col. 2 lines 29-32) Clearly, Iredale teaches away from creation of an output impedance of an audio power amplifier that is between about 25 percent and about 400 percent of an input impedance of a driver circuit that comprises passive filters and speaker drivers as described in Claim 1 since Iredale teaches a direct connection between a power amplifier and a speaker.

For at least the foregoing reasons, none of the cited prior art either alone or in combination, provides the third basic criteria for obviousness that must be met, which is that all the limitations of the claims must be taught or suggested by the combination of the cited prior art. (see MPEP 2143) Thus, all of the claim features described by Claim 1 and the claims depending therefrom are not

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taught or suggested, and a *prima facie* case of obviousness has not been established. Applicant respectfully requests withdrawal of the 35 U.S.C. §103(a) rejection of Claims 1-8, 10-14 and 35-37.

Claims 15-18, 21-25 and 38

Claim 15 describes the step of setting an output impedance of an audio power amplifier with a current feedback circuit included in the audio power amplifier. In contrast, Alexander teaches away by teaching controlling an output voltage of an audio amplifier as previously described. Claim 15 also describes that the output impedance is set to be between about 25 percent and about 400 percent of the arrangement cold impedance. Iredale, on the other hand, teaches away by teaching a power amplifier that is directly connected to a speaker having an approximately matching impedance, as previously discussed.

Thus, for at least the foregoing reasons, Applicant respectfully traverses the 35 U.S.C. §103(a) rejection of Claim 15 since all of the limitations described are not taught, suggested, or disclosed by the cited prior art, either alone or in combination and a *prima facie* case of obviousness is not supported. In addition, Claims 16-18, 21-25 and 38 depend from independent Claim 15 and therefore a *prima facie* case of obviousness is unsupported for these claims for at least the same reasons. Thus, Applicant respectfully requests withdrawal of the 35 U.S.C. §103(a) rejection of Claims 15-18, 21-25 and 38.

Claims 26, 28-29 and 39

Claim 26 describes an audio amplification means that comprises a current feedback amplifier configured to set the output impedance of an amplification means. In sharp contrast, Alexander describes a current feedback circuit used to adjust an output voltage of a power amplifier, as previously discussed.

For at least the foregoing reasons, Applicant respectfully traverses the 35 U.S.C. §103(a) rejection of Claim 26 since all of the described limitations are not taught, suggested, or disclosed by the cited prior art, either alone or in combination and a *prima facie* case of obviousness is unsupported. In addition, Claims 28-29 depend from independent Claim 26 and therefore a *prima facie* case of obviousness is unsupportable for these claims for at least the same reasons. Thus, Applicant respectfully requests withdrawal of the 35 U.S.C. §103(a) rejection of Claims 26 and 28-29.

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Claim 32 and 40

Claim 32 includes the step of configuring an output impedance of a current-feedback audio amplifier with a feedback signal, to be within the operational range of the input impedance of a driver circuit. Alexander, on the other hand, clearly teaches away by describing a feedback signal to control a voltage at an output terminal, as previously discussed. In addition, Iredale teaches away from configuring an output impedance to be within the operational range of the input impedance of a driver circuit as described in Claim 32, since Iredale teaches that a power amplifier directly drives only a loudspeaker, as previously discussed.

Accordingly, Applicant respectfully traverses the 35 U.S.C. §103(a) rejection of Claim 32 and Claim 40 since all of the limitations described are not taught, suggested or disclosed by the cited prior art, either alone or in combination and a *prima facie* case of obviousness is unsupported. Thus, Applicant respectfully requests withdrawal of the 35 U.S.C. §103(a) rejection of Claims 32 and 40.

Based on the foregoing remarks, the present pending claims of this application are allowable and Applicant respectfully requests the Examiner to issue a Notice of Allowance for this application. In the event a telephone conversation would expedite the prosecution/allowance of this application, the Examiner is invited to contact the undersigned at (317) 636-0886.

Respectfully submitted,



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